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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,041	02/04/2004	Jung Sig Jun	2080-3-226	5437
35884	7590	05/17/2005		
LEE, HONG, DEGERMAN, KANG & SCHMADEKA, P.C. 801 SOUTH FIGUEROA STREET 14TH FLOOR LOS ANGELES, CA 90017		EXAMINER FLANAGAN, KRISTA M		
		ART UNIT 2631		PAPER NUMBER

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/773,041	JUN ET AL.
	Examiner Krista M. Flanagan	Art Unit 2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 04 February 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 04 February 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "510" and "511" have both been used to designate the gain controller; reference characters "511" and "512" have both been used to designate the fourth squarer which happens to be labeled as a multiplier on the drawing; and reference characters "514" and "515" have both been used to designate the loop filter.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "512" has been used to designate both an adder and the fourth squarer.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 500.
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

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The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because line one states "Disclosed is a symbol clock ..." Please omit "Disclosed is". Correction is required. See MPEP § 608.01(b).
7. The disclosure is objected to because of the following informalities: Please define OQAM, A/D converter, and NCO where first mentioned in the specification. Please put a space between any numbers and their units (e.g. 2.690559MHz -> 2.690559 MHz) throughout the specification, including the claims. It is the examiner's opinion that [0028] should read, "...the signal passed through the Hilbert converter is called the Q channel signal." Please correct the description of figure 4 on pages 16-19, to reflect the correct reference characters. Please correct the spelling of "resampler" (resampler -> resampler) on page 5, paragraph [0012]. Please correct all statement regarding the "first resampler" as there is only one resampler. Page 11, paragraph [0036] please correct the spelling of base-band (bas-band -> base-band). Page 12, paragraph [0039], line 1, please correct: NCO1 402 -> NCO2 402.

Appropriate correction is required.

Claim Objections

8. Claims 1, 5, 8, 11, and 16 are objected to because of the following informalities: Connecting terms are missing between the subjects and actions (e.g. an a/d converter converting -> an a/d converter for converting, etc.). Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 2, 12, and 17 recite the limitation "the fixed oscillator" in line 3. There is

insufficient antecedent basis for this limitation in the claim.

11. Claims 8, 11, and 16 recite the limitation "the first resampler" in last lines. There is insufficient antecedent basis for this limitation in the claim. Should claim 8 depend from claim 4, which is dependent upon claim 1, where the resampler is mentioned for the first time? It is suggested that the word 'first' be omitted in all claims in regards to the resampler.

12. Claims 5-7, 10, 15, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Regarding claims 5-7 and 15, the claims 5 and 6 are self-dependent and claims 7 and 15 are exactly the same and depend from claim 6. Appropriate corrections are required and accordingly, the claims have not been treated on their merits.

14. Regarding claims 7, 10, 15 and 20, the claim language is indefinite and incomprehensible.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scarpa et al. U.S. Patent No. 5,673,293.

17. Regarding claim 1, Scarpa discloses a digital TV receiver, comprising: an A/D converter for converting an analog signal into a digital signal (See figure 1, block 114 and column 3, lines 27-30); a carrier recovery for converting the digital pass-band signal into a digital base-band signal (See figure 1, blocks 120 and 135 and column 7, lines 9-17); and a symbol clock recovery for converting digital real/imaginary base-band component signal into QAM type of real/imaginary component signals (See figure 1, block 147 and column 8, lines 50-59), detecting timing error information by performing the high pass-band filtering on the QAM real/imaginary signals, and squaring and adding the filtered value (where it is known that symbol timing recovery can be done by squaring and adding the filtered I and Q channels to produce tone at symbol frequency, see column 5, lines 36-45), and for generating and outputting at least two times the frequency of the symbol clock corrected from the detected timing error information (See figure 1, block 147 and column 5, lines 14-19). Where OQAM is simply “staggered QAM” and all results would still hold.

18. Regarding claim 2, which inherits all of the limitations of claim 1, Scarpa discloses a digital TV receiver wherein the A/D converter converts the analog pass-band signal transmitted in a VSB modulation type into a pass-band signal by sampling the analog signal at a fixed frequency generated from the fixed oscillator or at least two times the frequency of the symbol clock (See column 8, lines 37-49).

19. Regarding claim 3, which inherits all of the limitations of claim 1, Scarpa discloses a digital TV receiver wherein the carrier recovery multiplies the digital pass-band signal by a

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standard carrier signal generated through the carrier recovery process for converting the signal into the digital base-band signal (See figure 1, block 130 and column 7 line 9- column 8 line 4).

20. Regarding claim 4, which inherits all of the limitations of claim 1, Scarpa discloses a digital TV receiver which further comprises a resampler for resampling the digital real/imaginary base-band signals to at least two times the frequency of the symbol clock frequency, and interpolating each of the signals (See column 5, line 64 - column 6, line 55).

Allowable Subject Matter

21. Claim 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

22. Claims 13, 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting

23. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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24. Claims 1-7, 8, 9, 11, 14, 16, and 19 are provisionally rejected under the judicially created doctrine of double patenting over claims 1, 2, 4-9, 11, 12, 14 and 15 respectively of copending Application No. 10/761,754 ('754). This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

25. The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

- a. Regarding claim 1, the same digital television receiver is claimed in both applications (claim 1 of the '754 patent application).
- b. Regarding claim 2, '754 patent fails to use the phrase transmitted in a VSB modulation type but per ATSC standard all US digital television broadcasts will be transmitted in a VSB modulation type (claim 2 of the '754 patent application).
- c. Regarding claim 3, the same matter is claimed in both applications (claim 4 of the '754 patent application).
- d. Regarding claim 4, the same matter is claimed in both applications (claim 5 of the '754 patent application).
- e. Regarding claim 5, the same matter is claimed in both applications (claim 6 of the '754 patent application).
- f. Regarding claim 6, the same matter is claimed in both applications (claim 7 of the '754 patent application).

- g. Regarding claim 8, the current applications refers to a first and second squaring operator and an adder while the '754 application, claim 8, refers to a squarer where the squarer is the first and second squaring operators and the adder.
- h. Regarding claim 9, the same matter is claimed in both applications (claim 9 of the '754 patent application).
- i. Regarding claim 11, the same matter is claimed in both applications (claim 11, which inherits all of the limitations of claim 10, of the '754 patent application).
- j. Regarding claim 14, the same matter is claimed in both applications (claim 12 of the '754 patent application):
- k. Regarding claim 16, the same matter is claimed in both applications (claim 14, which inherits all of the limitations of claim 13, of the '754 patent application).
- l. Regarding claim 19, the same matter is claimed in both applications (claim 15 of the '754 patent application).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

The chart below summarizes the double patenting issues.

Claim	Current Application	'754 Application	Claim
1	A digital TV receiver, comprising: an A/D converter for converting an analog signal into a digital signal; a	A digital TV receiver, comprising: an A/D converter for converting an analog signal into a digital signal; a	1

	<p>carrier recovery for converting the digital pass-band signal into a digital base-band signal; and a symbol clock recovery for converting digital real/imaginary base-band component signal into OQAM type of real/imaginary component signals, detecting timing error information by performing the high pass-band filtering on the OQAM real/imaginary signals, and squaring and adding the filtered value, and for generating and outputting at least two times the frequency of the symbol clock corrected from the detected timing error information. No change in function or parts.</p>	<p>carrier recovery for converting the digital passband signal into a digital baseband signal; and a symbol clock recovery for converting digital real/imaginary baseband component signals into OQAM type of real/imaginary component signals, detecting timing error information by high-passband-filtering, squaring, and adding the OQAM real/imaginary signals, and for generating and outputting at least two times the frequency of the symbol clock corrected from the detected timing error information.</p>	
2	<p>The digital TV receiver of claim 1, wherein the A/D converter converts the analog pass-band signal transmitted in a VSB modulation</p>	<p>The digital TV receiver of claim 1, wherein the A/D converter converts the analog passband signal into a passband signal by sampling the</p>	2

	<p>type into a pass-band signal by sampling the analog signal at a fixed frequency generated from the fixed oscillator or at least two times the frequency of the symbol clock. A VSB modulation type, per ATSC standard, is in use for all digital television broadcasts.</p>	<p>analog signal at a fixed frequency generated from the fixed oscillator or at least two times the frequency of the symbol clock.</p>	
3	<p>The digital TV receiver of claim 1, wherein the carrier recovery multiplies the digital pass-band signal by a standard carrier signal generated through the carrier recovery process for converting the signal into the digital base-band signal. No change in function or parts.</p>	<p>The digital TV receiver of claim 1, wherein the carrier recovery multiplies the digital passband signal by a standard carrier signal through the carrier recovery process for converting the signal into the digital baseband signal.</p>	4
4	<p>The digital TV receiver of claim 1 further comprises a resampler for resampling the digital real/imaginary base-band signals to at least two times the frequency of the symbol clock frequency, and interpolating each of</p>	<p>The digital TV receiver of claim 1 further comprises a resampler for resampling the digital real/imaginary baseband signals to at least two times the frequency of the symbol clock frequency, and interpolating each of</p>	5

	the signals. No change in function or parts.	the signals.	
5	The digital TV receiver of claim 5, wherein the symbol clock recovery comprises: an OQAM converter converting each of the digital baseband real/imaginary signals interpolated and outputted from the resampler into OQAM real/imaginary component signals; a high pass filter performing a high pass-band filtering on the OQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section, a squarer squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high pass-band filter, and adding and outputting the calculation; a pre-filter passing only a frequency of a predetermined band from the output of	The digital TV receiver of claim 5, wherein the symbol clock recovery comprises: an OQAM converter for converting each of the digital baseband real/imaginary signals interpolated and outputted from the resampler into OQAM real/imaginary component signals; a high pass filter performing a high-passband-filtering to the OQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section; a squarer for squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high passband filter, and adding and outputting the calculation; a pre-filter for passing only a frequency of a particular band to recover the symbol	6

	<p>the squarer for recovering the symbol clock; a timing error detector detecting timing error information from the output of the pre-filter; a filtering member filtering only a low pass-band signal from the timing error information outputted from the timing error detector; and an NCO generating at least two times the frequency of the symbol clock interpolated according to low pass-band components of the filtered timing error information and outputting to the first resampler.</p> <p>Interpolated and recovered are synonymous here. No change in function or parts.</p>	<p>clock from the output of the squarer; a timing error detector for detecting timing error information from the output of the pre-filter; a filtering member for filtering only the low passband signal from the timing error information outputted from the timing error detector; and an NCO for generating at least two times the frequency of the symbol clock recovered according to low passband signals of the filtered timing error information and outputting to the first resampler.</p>	
6	<p>The digital TV receiver of claim 6, wherein the OQAM converter multiplies digital base-band real/imaginary component signals interpolated and outputted from the resampler by a fixed frequency with a</p>	<p>The digital TV receiver of claim 6, wherein the OQAM converter multiplies digital baseband real/imaginary component signals interpolated and outputted from the resampler by a fixed frequency with a</p>	7

	<p>center frequency of 2.690559 MHz for converting digital base-band real/imaginary component signals into the OQAM real/imaginary component signals. No change in function or parts.</p>	<p>center frequency of 2.690559 MHz for converting digital baseband real/imaginary component signals into the OQAM real/imaginary component signals.</p>	
8	<p>The digital TV receiver of claim 1, wherein the symbol clock recovery comprises: an OQAM converter converting each of the digital baseband real/imaginary signals outputted from the carrier recovery into OQAM real/imaginary component signals; a high pass filter performing a high pass-band filtering on the UQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section; a first squaring operator squaring each of the OQAM real/imaginary component signals filtered by and outputted from the</p>	<p>The digital TV receiver of claim 1, wherein the symbol clock recovery comprises: an OQAM converter for converting each of the digital baseband real/imaginary signals outputted from the carrier recovery into OQAM real/imaginary component signals; a high pass filter performing a high-passband-filtering to the OQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section; a squarer for squaring each of the OQAM real/imaginary component signals filtered by and outputted from the</p>	8

	<p>high pass filter, and calculating difference of the two squared signals and squaring the calculation; a second squaring operator squaring each of the OQAM real/imaginary component signals filtered by -an outputted from the high pass filter, and calculating and squaring a difference of the two squared signals; an adder adding the output of the first and second squaring operators; a pre-filter passing only a frequency of a predetermined band for recovering the symbol clock from the output of the adder; a timing error detector detecting timing error information from the output of the pre-filter; a filtering member filtering only the low pass-band signal from the timing error information outputted from the timing error detector; and an</p>	<p>high passband filter, and adding and outputting the calculation; a pre-filter for passing only a frequency of a particular band to recover the symbol clock from the output of the squarer; a timing error detector for detecting timing error information from the output of the pre-filter; a filtering member for filtering only the low passband signal from the timing error information outputted from the timing error detector; and an NCO for generating at least two times the frequency of the symbol clock recovered according to low passband signals of the filtered timing error information and outputting to the first resampler.</p>	
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	<p>NCO for generating at least two times the frequency of the symbol clock recovered according to low pass-band signals of the filtered timing error information and outputting to the first resampler. Where the squarer in the '754 application is the first and second squaring operators and the adder in the current application.</p> <p>The output of the squarer is the output of the adder because the adder is the last step in the squaring operator. No change in function or parts.</p>		
9	<p>The digital TV receiver of claim 8, wherein the OQAM converter multiplies the VSB digital base-band real/imaginary component signals outputted from the carrier recovery by the fixed frequency with a center frequency of 2.690559 MHz for converting the VSB digital base-band</p>	<p>The digital TV receiver of claim 8, wherein the OQAM converter multiplies the VSB digital baseband real/imaginary component signals outputted from the carrier recovery by the fixed frequency with a center frequency of 2.690559 MHz for converting the VSB digital baseband</p>	9

	real/imaginary component signals into the OQAM real/imaginary component signals. No change in function or parts.	real/imaginary component signals into the OQAM real/imaginary component signals.	
11	A digital TV receiver, comprising: an A/D converter converting an analog signal into a digital signal; a carrier recovery converting the digital pass-band signal into a digital base-band signal; a resampler resampling digital base-band real/imaginary component signals outputted from the carrier recovery to at least two times the frequency of the symbol clock and interpolating each of the signals; an OQAM converter converting each of the digital base-band real/imaginary signals interpolated and outputted from the resampler into OQAM real/imaginary component signals; a high pass filter performing a high pass-band	A digital TV receiver, comprising: an A/D converter for taking a sample of a fixed frequency from a VSB type of analog passband signal for converting the signal into a digital passband signal; a carrier recovery for multiplying the VSB digital passband signal by a standard carrier signal generated from the carrier recovery process for converting the signal into a VSB digital baseband signal; a resampler for taking a sample of at least two times the frequency of the symbol clock from the VSB digital baseband real/imaginary signals generated from the carrier recovery so as to interpolate the signals; and a symbol clock recovery for	11

	<p>filtering on the OQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section; a squarer squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high pass-band filter, and adding and outputting the calculation; a pre-filter passing only a frequency of a predetermined band from the output of the squarer for recovering the symbol clock; a timing error detector detecting timing error information from the output of the pre-filter; a filtering member filtering only a low pass-band signal from the timing error information outputted from the timing error detector; and an NCO generating at least two times the frequency of the symbol clock</p>	<p>converting the VSB digital real/imaginary baseband component signals into OQAM type of real/imaginary component signals, detecting timing error information by high-passband-filtering, squaring, and adding the OQAM real/imaginary signals, and generating and outputting at least two times the frequency of the symbol clock corrected from the detected timing error information wherein the symbol clock recovery comprises: an OQAM converter for converting each of the digital baseband real/imaginary signals interpolated and outputted from the resampler into OQAM real/imaginary component signals; a high pass filter performing a high-passband-filtering to the OQAM real/imaginary component signals</p>	
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	<p>interpolated according to low pass-band components of the filtered timing error information and outputting to the first resampler.</p> <p>No change in functions or parts.</p>	<p>outputted from the OQAM converter for removing information of data section; a squarer for squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high passband filter, and adding and outputting the calculation; a pre-filter for passing only a frequency of a particular band to recover the symbol clock from the output of the squarer; a timing error detector for detecting timing error information from the output of the pre-filter; a filtering member for filtering only the low passband signal from the timing error information outputted from the timing error detector; and an NCO for generating at least two times the frequency of the symbol clock recovered according to low</p>	
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		passband signals of the filtered timing error information and outputting to the first resampler.	
14	The digital TV receiver of claim 11, wherein the OQAM converter multiplies digital base-band real/imaginary component signals interpolated and outputted from the resampler by a fixed frequency with a center frequency of 2.690559 MHz for converting digital base-band real/imaginary component signals into the OQAM real/imaginary component signals. No change in function or parts.	The digital TV receiver of claim 11, wherein the OQAM converter multiplies digital baseband real/imaginary component signals interpolated and outputted from the resampler by a fixed frequency with a center frequency of 2.690559M1-1z for converting digital baseband real/imaginary component signals into the OQAM real/imaginary component signals.	12
16	A digital TV receiver, comprising: an A/D converter converting an analog signal into a digital signal; a carrier recovery converting the digital passband signal into a digital base-band signal; a resampler resampling digital base-band real/imaginary component	A digital TV receiver, comprising: an A/D converter taking a sample of at least two times the frequency of the symbol clock from a VSB analog passband signal for converting the signal into a digital passband signal; a carrier recovery multiplying the VSB	14

	<p>signals outputted from the carrier recovery to at least two times the frequency of the symbol clock and interpolating each of the signals; an OQAM converter converting each of the digital base-band real/imaginary signals interpolated and outputted from the resampler into OQAM real/imaginary component signals; a high pass filter performing a high pass-band filtering on the OQAM real/imaginary component signals outputted from the OQAM converter for removing information of data section; a first squaring operator squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high pass filter, and calculating difference of the two squared signals and squaring the calculation; a second squaring</p>	<p>digital passband signal by a standard carrier signal generated from the carrier recovery process for converting the signal into a VSB digital baseband signal; a resampler taking a sample of at least two times the frequency of the symbol clock from the VSB digital baseband real/imaginary signals generated from the carrier recovery and interpolating the signals; and a symbol clock recovery for converting the VSB digital baseband real/imaginary component signals into OQAM type of real/imaginary component signals, detecting timing error information by high-passband-filtering, squaring, and adding the OQAM real/imaginary signals, and generating and outputting at least two times the frequency of the symbol clock corrected from the detected timing error information,</p>	
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	<p>operator squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high pass filter, and calculating and squaring a difference of the two squared signals; an adder adding the output of the first and second squaring operators; a pre-filter passing only a frequency of a predetermined band for recovering the symbol clock from the output of the adder; a timing error detector detecting timing error information from the output of the pre-filter; a filtering member filtering only the low pass-band signal from the timing error information outputted from the timing error detector; and an NCO for generating at least two times the frequency of the symbol clock recovered according to low pass-band signals of the filtered timing error</p>	<p>wherein the symbol clock recovery comprises: an OQAM converter for converting each of the VSB digital baseband real/imaginary signals outputted from the carrier recovery into OQAM real/imaginary component signals; a high pass filter performing a high-passband-filtering to the OQAM real/imaginary component signals outputted section; from the OQAM converter for removing information of data section; a squarer for squaring each of the OQAM real/imaginary component signals filtered by and outputted from the high passband filter, and adding and outputting the calculation; a pre-filter for passing only a frequency of a particular band to recover the symbol clock from the output of the squarer; a timing error detector for detecting timing error</p>	
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	<p>information and outputting to the first resampler. Where the squarer in the '754 application is the first and second squaring operators and the adder in the current application. The output of the squarer is the output of the adder because the adder is the last step in the squaring operator. No change in function or parts.</p>	<p>information from the output of the pre-filter; a filtering member for filtering only the low passband signal from the timing error information outputted from the timing error detector; and an NCO for generating at least two times the frequency of the symbol clock recovered according to low passband signals of the filtered timing error information and outputting to the first resampler.</p>	
19	<p>The digital TV receiver of claim 16, wherein the OQAM converter multiplies digital base-band real/imaginary component signals interpolated and outputted from the resampler by a fixed frequency with a center frequency of 2.690559 MHz for converting digital base-band real/imaginary component signals into the OQAM real/imaginary component signals. No change in function or</p>	<p>The digital TV receiver of claim 14, wherein the OQAM converter multiplies the VSB digital baseband real/imaginary component signals outputted from the carrier recovery by the fixed frequency with a center frequency of 2.690559 MHz for converting the VSB digital baseband real/imaginary component signals into the OQAM real/imaginary component signals.</p>	15

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Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. U.S. Patent No. 5,872,815 to Strolle et al. discloses an apparatus for generating timing signals for a digital television signal receiver.
- b. U.S. Patent No. 6,160,443 to Maalej et al. discloses a dual automatic gain control in a QAM demodulator.
- c. U.S. Patent No. 6,862,325 to Gay-Bellile et al. discloses a multi-standard channel decoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krista M. Flanagan whose telephone number is (571) 272-2203. The examiner can normally be reached on Monday - Friday, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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